



Charlotte Mason's House of Education,
Scale How, Ambleside, UK, 2009

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ARITHMETIC IN THE NURSERY—AND BEYOND.

BY FRANCES EPPS.

(Continued from page 207.)

STAGE III.

THE small climber has now come to a steeper bend in his upward path, and much care and thought, on the part of his travelling companion, are needed to guide his steps and to secure independent effort.

His growing, practical interest in the subject, his power to see and use, mentally, the numbers he has learnt, also his knowledge of the figures which represent them, all this forms, so to speak, the reserve strength which the child possesses, to meet the new demands upon him, for he is now to learn how to set down and work sums, using figures and arithmetical signs, gradually dispensing with the use of objects.

All through this stage, he works with his teacher at the blackboard or slate before them, and it is essential that he has her undivided attention, her mind directly influencing his, during their ten minutes' daily lesson.

The following suggested steps for these lessons may seem almost absurdly simple, especially to a teacher who is "clever" at arithmetic herself, or who has the care of brilliant children, who intuitively see things and forge ahead. But the great majority of small learners too often suffer sore discouragement and delay, from missing some link in their work, a link necessary to true progress, but so minute, perhaps, from the point of view of a proficient grown-up, that the loss of it is not recognised till the child, having lost the thread and his interest, makes unaccountable and so-called stupid mistakes.

Let us then not be afraid of wasting time over too many details—where they are needed—but, casting aside all mere lifeless wooden repetitions as the worst stumbling block, let us so use the time at our disposal in the sweet, leisurable nursery days, "making haste, slowly," that our arithmetic

teaching may not only worthily train the little ones for future work in that particular direction, but give them the priceless possession of real love for that work, as well as the memory of a happily busy childhood.

But the blackboard, chalk and dusters are awaiting us in a quiet, airy room. So let us proceed to the work in hand—to lead the child to transfer and express by means of figures and signs, the knowledge which he has already gained by word of mouth and by the use of objects.

Pinning a domino card to the board, perhaps the double four, lengthways, the child will write without hesitation 4 4 8 from the dots on it. The teacher will supply the sign +, calling it *plus*, more, and explaining that when written between two figures it means that they are to be *added*. One has now a good hope that the child will supply the sign = himself (from his experience in writing out his little pence table), and the line will stand $4 + 4 = 8$, and the pleasure will be great, as card after card is picked out and correctly transcribed and read.

The "play" coins can next give the proud satisfaction of doing "money" sums. A row of four pennies added to a row of seven pennies gives eleven pennies, and will be written on the board $4d. + 7d. = 11d.$; practice will be continued with groups of shillings and sovereigns on the same lines, and the use of the letters £ s. d. be commented upon.

The foot and yard measures will next be introduced to help in setting down and adding lengths, from them the child will write $7 \text{ in.} + 3 \text{ in.} = 10 \text{ in.}$; $2 \text{ ft.} + 7 \text{ ft.} = 9 \text{ ft.}$; $9 \text{ yds.} + 5 \text{ yds.} = 14 \text{ yds.}$; the abbreviations of the words, inches, feet and yards will be explained and practised.

Next, the addition of more than two similar numbers—possibly now without counters—may be attempted, with the view of leading on to *multiplication*, $3 + 3 + 3 + 3 = 12$; $5 + 5 + 5 = 15$. When the child is clear that the three has been taken four times to make twelve, and the five three times to make fifteen, he can learn the sign $\times$, reading it multiplied by—folded many times—and proceed to write in two columns additions and equivalent multiplications.

$$3 + 3 + 3 + 3 = 12$$

$$5 + 5 + 5 = 15$$

$$3 \times 4 = 12$$

$$5 \times 3 = 15$$

This method turns the light of day on the old bogy of the multiplication table with all its needless "vexation."

Multiplication of money sums will follow next, at first perhaps illustrated by the coins, and written on the board thus,

$$3d. \times 3 = 9d.; \quad 4s. \times 5 = 20s. \text{ or } \pounds 1.$$

next, from the measure,

$$6\text{ in.} \times 3 = 18\text{ in.}; \quad 4\text{ ft.} \times 5 = 20\text{ ft.}$$

Occasionally it may be well to make sure that there is no parrot work by giving an interest to the figures, in as few words as possible, thus, five hats at four shillings cost one pound; three button-holes each six inches long, take half a yard of ribbon.

The setting down of *subtraction* sums with the sign — calling it *minus*, or less, will offer but little difficulty, and will be illustrated at first with counters, coins, and yard measure; proving by addition may be used once or twice thus:—

$$\begin{array}{ll} 13 - 7 = 6 & 6 + 7 = 13 \\ \pounds 19 - \pounds 12 = \pounds 7 & \pounds 7 + \pounds 12 = \pounds 19 \end{array}$$

Next, practice in taking away two or more similar numbers will lead on to *division*, e.g. :—

$$6 - 2 - 2 = 2; \quad 10d. - 5d. - 5d. = 0; \quad 12s. - 4s. - 4s. = 4s.$$

and a few lessons can be profitably used in writing, illustrated at first by counters, such statements as $6 - 2 - 2 - 2 = 0$; $14 - 7 - 7 = 0$.

The child has already in the Stage II. had practice in sharing out and dividing bricks, coins, etc., and can now pass on to the division sign $\div$, reading it, *divided by*, and realising that $14 \div 7$ means $14 - 7 - 7$, that is that seven can be taken away from fourteen two times or twice; that $6 \div 2$ means $6 - 2 - 2 - 2$; that is, that two can be taken from six, three times. Further practice will follow with the coins and measure, e.g. :—

$$10d. \div 2 = 5d.; \quad 18s. \div 9 = 2s.; \quad 20\text{ in.} \div 5 = 4\text{ in.}$$

and as before it may be useful occasionally to test by examples. Tenpence will buy two toys at fivepence; eighteen shillings will pay for nine presents at two shillings; twenty inches of ribbon will make five markers, four inches long.

When the child can interpret, rapidly and correctly, all the sums (using still only numbers up to twenty) that the ingenuity of his teacher can suggest, using the signs he has learned, and can also write them on the board from her dictation, it will be well to teach him that if two figures, one above the other, have a line between them, the meaning is, that the upper is to be divided by the lower; so $\frac{4}{2}$ (read four upon two, or four divided by two) is another way of writing $4 \div 2$ and means just the same; writing a few examples he can learn the name *divisor* and notice the difference of its position in the two methods.

Reference to his counters will soon make clear the difference between odd and even numbers, by spacing out twos in rows of from three to twenty. This will lead on to the name *remainder*, what is left over, and the method of writing it down; thus, $\frac{1}{2}$ means one divided by two, and the child will not need many illustrations to understand that one divided by two, is a half. After working a few sums such as:—

$$\frac{15}{2} = 7\frac{1}{2}; \quad \frac{9}{2}d. = 4\frac{1}{2}d.; \quad \frac{15}{2}s. = 7s. 6d.$$

he can pass on to quarters, $\frac{17}{4} = 4\frac{1}{4}$; that is, seventeen divided by four gives four heaps of four and one over: this one over has to be divided by four, and so a fourth or quarter belongs to each heap. The farthings (fourthings of a penny) can now be added to the pence and halfpence for practice (it will be remembered that the nursery shop-keeping has made "exchange" familiar), and soon there will be no difficulty in working such sums as:—

$$\frac{4}{4}d. = 1\frac{1}{4}d.; \quad \frac{11}{4}d. = 2\frac{3}{4}d.; \quad \frac{10}{4}d. = 2\frac{1}{2}d. \text{ or } 2\frac{1}{2}d.$$

So far for the scheme of the daily lesson for Stage III, always worked with the teacher on the blackboard, at a fixed time when the child is at his freshest.

He will besides keep up the few minutes *mental drill*, to which he is accustomed, as well as the training for remembering numbers.

Care will also be given to maintain interest in his *practical* work, not only the games he has learnt, especially the matador dominoes, but in developing the unfailing delights of "keeping shop."

Is the happy child playing about the fringe of the common, close to lanes full of flowers? Then we find the convenient gravel pit, and with the aid of a little wire and thread, and perhaps a few bamboos with holes cut above each joint, and some tins that can be covered with moss from the beechwood close by, set up with care and taste, a really pretty flower stall. What matter if the mother-teacher has to impersonate a steady flow of customers? Her wants can all be supplied, from a garland of heather to a button-hole bouquet; prices marked in plain figures, and cash with orders—from the play money box—being the terms. Again have we the mumps, or are we getting over measles? A grocery store, with real beans, currants, and sugar, with real scales to weigh them, and real paper bags to put them in, will turn the wettest, foggiest, dullest day into a bright one!

Measuring, too, with stick and tape can become more satisfying as the little hands grow stronger, and the little feet are taught to mount, as they should be, a step ladder in the safe way. The child can also be allowed the pleasure of measuring half-pints, pints and quarts—real water, please, as a training in deftness—and be invited to estimate the quantity of water needed for dinner if every one has half a pint, how many pints to fill the aquarium holding three and a half pints, how much milk for breakfast, and so on.

He can still spend five minutes (between tea and the final bedtime play?), writing a few tables with pencil in his exercise book as before, no rubbing out, nor corrections allowed; adding now practice in ruling lines, in making the signs he is learning, and in the use of Roman figures up to five.

NOTES OF LESSONS.

[We have thought that it might be of use to our readers (in families and schools) to publish occasionally Notes of Lessons prepared by students of the House of Education for the pupils of the Practising School. We should like to say, however, that such a Lesson is never given as a *tour de force*, but is always an illustration or an expansion of some part of the children's regular studies (in the *Parents' Review School*), of some passage in one or other of their school books.—ED.]

I.

Subject: Dictation.

Group: English. Class II. Time: 20 minutes.

BY JOSEPHINE M. WILKINSON.

OBJECTS.

- I. To increase the girls vocabulary.
- II. To help them to visualise words and so write them correctly at their first attempt.
- III. To improve their handwriting and composition.
- IV. To help to form habits of neatness and accuracy.

LESSON.

Step I.—Let the children look over two pages of *Parables from Nature*, by Mrs. Gatty (for seven or eight minutes), which is new to them, but in which they are already interested.

Step II.—Ask the children for any words they have not met with before, and write them upon the blackboard, giving other words like them, if possible, *e.g.*, narrow, harrow, marrow; to make a stronger impression.

Step III.—Choose a short passage from the two pages, and dictate once distinctly and clearly, not word by word, but in phrases. Look at the books as the children write, and *if* any mistakes do occur, cover them over with strips of stamp paper, as soon as they are made and let them be rewritten correctly, so that the children may not get a wrong impression of a word fixed in their minds.

Step IV.—Correct, noticing the neatness, accuracy and improvement in handwriting, and give encouragement accordingly.